WHAT IS CLAIMED IS:

1. An apparatus for calibrating a spectral imaging system, comprising:

a sample;

a first source for illuminating said sample with radiation within a first band of wavelengths, wherein said first band of wavelengths excites regions within said sample causing said regions to emit radiation within a second band of wavelengths;

an interferometer for spectrally resolving said wavelengths within said second band of wavelengths, wherein said interferometer creates an interferogram of said sample that is superimposed on an image of said sample transmitted by said interferometer;

a detector array with a first portion and a second portion, wherein said sample and said interferogram of said sample are imaged on said first portion, wherein said detector array outputs a plurality of signals corresponding to an intensity at each pixel of said array;

a slit within an image plane of said spectral imaging system;

a second source for illuminating said slit with radiation of at least one predefined wavelength, wherein said interferometer creates an interferogram of said slit, said slit interferogram imaged on said second portion of said detector array; and

a processor coupled to said detector array, said processor performing an analysis on said sample interferogram to translate said sample interferogram into chromatic space, and said processor performing said analysis on said slit interferogram to translate said slit interferogram into chromatic space, wherein said processor utilizes said translation of said slit interferogram to calibrate said chromatic space.

2. The apparatus of claim 1, wherein said analysis is Fourier transform analysis.

3. The apparatus of claim 1, wherein said second source is a solid state laser.

4. A method of calibrating a spectral imaging system, comprising the steps of:

illuminating a sample with a first source of radiation, said first source exciting regions within said sample causing said regions to emit radiation within a group of wavelengths;

creating an interferogram of said sample;

monitoring said sample interferogram with a first portion of a detector array;

translating said monitored sample interferogram into a chromatic space;

illuminating a slit within an image plane of said spectral imaging system with a second source of radiation of at least one predefined wavelength;

creating an interferogram of said slit;

monitoring said slit interferogram with a second portion of said detector array;

translating said monitored slit interferogram into said chromatic space; and

calibrating said chromatic space with said translated slit interferogram.

5. A method of aligning a spectral imaging system utilizing an interferometer, comprising the steps of:

injecting a laser beam into a microscope within said spectral imaging system;

focussing said microscope portion;

focussing beams projecting through a pair of eyepieces associated with said microscope portion, wherein said focussed beams have a set orientation and a set spacing;

removing one of said pair of eyepieces from an eyepiece housing;

maneuvering said focussed beam relative to an unfocussed beam passing through said eyepiece housing such that said focussed beam and said unfocussed beam have said set orientation and said set spacing;

switching said laser beam to pass through an interferometer coupled to said microscope within said spectral imaging system;

removing a beam splitter within said interferometer;

aligning said laser beam with a center of each turning mirror associated with said interferometer;

aligning said laser beam with a center of an output relay lens and a detector array associated with said interferometer;

re-inserting said beam splitter into said interferometer;

adjusting said beam splitter so that only a single beam enters said output relay lens;

removing said laser beam from said system;

centering an output of said microscope onto said detector array;

focussing fringes created by said interferometer using said output relay lens;

inserting a test pattern into said microscope; and

adjusting an input relay lens to achieve an optimum focus of said test pattern.

6. The method of claim 5, wherein a neutral density filter is inserted within said system prior to aligning said laser beam with a center of said detector array.

7. An apparatus for obtaining a monochrome sample image in a spectral imaging system that includes an interferometer, comprising:

a sample;

a source for illuminating said sample with radiation within a first band of wavelengths, wherein said first band of wavelengths excites regions within said sample causing said regions to emit radiation within a second band of wavelengths;

an interferometer for spectrally resolving said wavelengths within said second band of wavelengths, wherein said interferometer creates an interferogram of said sample that is superimposed on an image of said sample transmitted by said interferometer, wherein said interferometer is comprised of at least a pair of turning mirrors and a beam splitter forming a pair of legs for said interferometer;

a detector array, wherein said sample and said interferogram of said sample are imaged on said detector, wherein said detector array outputs a plurality of signals corresponding to an intensity at each pixel of said array;

an optic with a first position and a second position, wherein said optic in said first position is adjacent to one of said pair of turning mirrors and intercepts light

beams within said interferometer passing to and from said one of said pair of turning mirrors thereby producing a large offset in said pair of legs of said interferometer, wherein said optic in said second position does not intercept light beams within said interferometer, wherein said large offset causes a density of fringes created within said interferogram to become larger than the resolution limits of said detector array; and

a processor coupled to said detector array, wherein said processor generates said monochrome image of said sample from said output signals of said detector array when said optic is in said first position.

8. The apparatus of claim 7, wherein said optic is formed of BK-7 and is at least 5 millimeters thick.

9. The apparatus of claim 7, wherein said optic is coupled to a translation mechanism, said translation mechanism moving said optic from said first position to said second position.

10. The apparatus of claim 9, wherein said translation mechanism is controlled by said processor.

11. A method of obtaining a monochrome sample image in a spectral imaging system that includes an interferometer, wherein said interferometer is comprised of at least a pair of turning mirrors and a beam splitter to form a pair of legs, said method comprising the steps of:

inserting an optic adjacent to one of said pair of turning mirrors, wherein said optic intercepts light beams within said interferometer thereby producing a large offset in said pair of legs of said interferometer, said large offset causing a density of fringes within an interferogram created by said interferometer to become larger than the resolution limits of a detector array, said detector array monitoring an output of said interferometer;

generating said monochrome image of said sample with a processor, said processor coupled to said detector array; and

displaying said monochrome image on a monitor coupled to said processor.

12. A spectral imaging system, comprising:

a sample;

a source for illuminating said sample with radiation within a first band of wavelengths, wherein said first band of wavelengths excites regions within said sample causing said regions to emit radiation within a second band of wavelengths;

an interferometer for spectrally resolving said wavelengths within said second band of wavelengths, wherein said interferometer creates an interferogram of said sample that is superimposed on an image of said sample transmitted by said interferometer, wherein said interferometer includes at least two turning mirrors and one polarizing beam splitter, wherein said polarizing beam splitter preferentially reflects a first polarization and preferentially transmits a second polarization;

a detector array, wherein said sample and said interferogram of said sample are imaged on said detector array, wherein said detector array outputs a plurality of signals corresponding to an intensity at each pixel of said array; and

a processor coupled to said detector array and coupled to a monitor, said processor displaying an image of said sample on said monitor.

13. The spectral imaging system of claim 12, wherein said polarizing beam splitter is a polarizing cube.

14. A metaphase spread finding apparatus, comprising:

a sample plate containing a sample, wherein said sample includes at least one metaphase spread;

a first source for illuminating said sample plate with radiation of a first wavelength, wherein said first wavelength preferentially scatters from said metaphase spreads;

a detector for monitoring radiation scattered from a plurality of locations on said sample, wherein said detector outputs a first plurality of signals corresponding to an intensity of said scattered radiation at said plurality of locations; and

a processor coupled to said detector, wherein said processor determines locations corresponding to metaphase spreads from said plurality of locations on said sample from said first plurality of detector output signals.

15. The metaphase spread finding apparatus of claim 14, further comprising a second source for illuminating said sample plate with radiation of a second wavelength, wherein said second wavelength is not preferentially scattered by said metaphase spreads, wherein said detector outputs a second plurality of signals corresponding to said intensity of said scattered radiation of said second wavelength at said plurality of locations, wherein said processor subtracts said second plurality of signals from said first plurality of signals prior to determining said locations of said metaphase spreads.

16. The metaphase spread finding apparatus of claim 14, wherein radiation from said first source is raster scanned across said sample plate.

17. The metaphase spread finding apparatus of claim 14, wherein said detector monitors reflected scatter.

18. The metaphase spread finding apparatus of claim 14, wherein said sample plate is substantially transparent to said first wavelength, and wherein said detector monitors transmitted scatter.

19. The metaphase spread finding apparatus of claim 17, further comprising a second detector for monitoring radiation scattered from said plurality of locations on said sample and passing through said sample plate, wherein said sample plate is substantially transparent to said first wavelength, wherein said second detector outputs a second plurality of signals corresponding to an intensity of said scattered radiation at said plurality of locations, and wherein said processor determines said locations corresponding to said metaphase spreads from said plurality of locations from said first plurality of output signals from said first detector and said second plurality of output signals from said second detector.

20. The metaphase spread finding apparatus of claim 14, wherein said detector is a detector array comprised of a plurality of pixels, said pixels corresponding to said plurality of locations on said sample.

21. The metaphase spread finding apparatus of claim 20, wherein said entire sample plate is simultaneously illuminated by said first source.

22. The metaphase spread finding apparatus of claim 14, wherein said metaphase spread finding apparatus is coupled to a spectral imaging system.

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